REMARKS

Claim Rejections – 35 USC § 103

Claims 1-7, 9 and 12

The Examiner rejected claims 1-7, 9 and 12 as unpatentable over CH 639,884 in view of Klotzbücher et al and further in view of Koch et al.

Applicant has arranged for an English translation of CH 639,884 and attaches a copy for the Examiner's convenience.

The Examiner stated that CH 639,884 teaches a V-shaped support for a billet, but fails to teach the use of a synchronous cutting saw and the resilient property of the V-shaped support.

Klotzbücher et al was relied on by the Examiner to show a synchronous flying saw. It is to be noticed, however, that in Klotzbücher et al., billets are clamped by the beam 35, which is mounted on the unit 32 and moves together with the unit 32 (Col. 4, lines 42 to 56). The beam 35 forces the billets against the roller track 4. The billets contact the beam at a point contact at the top, and the rollers at rolling point contacts at the bottom, so the billets are not securely held unless the clamping force of the beam is very strong, which could result in marking of the billets.

As noted by the Examiner, CH 639,884 does not teach a V-shaped supports having a resilient property. Furthermore, the supports of Klotzbücher et al are also not resilient. The Examiner therefore cited Koch et al. as showing resilient supports. However, Koch et al. relates to a moving handrail construction of the kind used for escalators or moving sidewalks found in airports. This is a completely different field of art from that of metal casting apparatus and a person skilled in the latter would not think of looking at the handrail art for inspiration. Handrails are also normally provided with a generally flat top rather than a V-shape as required in the present invention. It is not immediately apparent that the flat top design of Koch et al. could be modified to a V-shaped design as required in the present invention. Further, it should be kept in mind that handrails are not intended to carry heavy weights (such as metal billets) that may still be hot from casting and that are forcibly clamped against the handrail elements. In contrast, handrails normally receive no more weight than the weight of

a hand loosely held on the handrail elements, so a different degree of weight carrying ability would be required assumed for the industrial application of the present invention.

Finally, it should be noted that Koch et al. does not stress the resilient nature of the links and, indeed, the links can be made of metal (Column 4, line 1). There is in fact no need to make the links resilient because the primary function is to provide a handrail that is secure, wear-free and (presumably) comfortable to hold. The latter property does not, however, require a resilient link. A metal link or a hard inflexible plastic could also be comfortable to hold.

There is therefore nothing in Koch et al. to suggest that to a person skilled in the metal casting arts that there would be any advantage whatsoever in using the handrail design of Koch et al to supplement or replace the conveyor mechanism of CH 639,884 or Klotzbücher et al. This is especially true as CH 639,884 and Klotzbücher et al do not refer to any problems relating to the non-resilient nature of the supports that they employ.

It is therefore submitted that there would be no reason for a person skilled in the art to combine the teaching of Koch et al. with that of the other references. Withdrawal of the rejection is therefore requested.

Claim 8

The Examiner went on to reject the subject matter of claim 8 as being unpatentable over CH 639,884 in view of Klotzbücher et al., and further in view of Koch et al. and Brooke et al.

For the reasons given above, it is believed to be improper to combine Koch et al. with either CH 639,884 or Klotzbücher et al.

Moreover, Brooke et al. also relates to handrails, and is thus irrelevant for the same reasons as Koch et al. Additionally, it can be seen from Fig. 1 of Brooke et al. that there are large gaps between the handrail and supporting element that would be unacceptable for conveyors used for supporting metal billets. An objective of the present invention is to hold the billets securely so that precise cutting can be achieved.

It is therefore believed that the rejection of claim 8 should be withdrawn.

Claims 10-11

The Examiner rejected claims 10 and 11 for lack of invention over CH 639,884 in view of Klotzbücher et al and further in view of Koch et al and Lyons.

For the reasons given above, it is believed to be improper to combine Koch et al. with either CH 639,884 or Klotzbücher et al.

These claims are dependent indirectly on claim 1 and are therefore believed to be patentable for the same reason as claim 1.

Claims 13-15

The Examiner rejected claims 13 to 15 for lack of invention over CH 639,884 in view of Klotzbücher et al and further in view of Flowers.

These claims have been canceled without prejudice.

Claims 16-19

The Examiner rejected claims 16 to 19 for lack of invention over CH 639,884 in view of Klotzbücher et al and further in view of Sugimoto.

Sugimoto discloses a hydraulic device for controlling the downward movement of a band saw as it saws through a workpiece. It provides a measure of resistance to the cutting feed as the blade moves through the workpiece. However, the control means is passive, i.e. the resistance is provided solely by the weight of the saw assembly. A person skilled in the art would not be motivated to add the device of Sumitomo to the saw disclosed in Klotzbücher et al since such a person would view it only as a substitute for the advancing means already present. As the saw of Klotzbücher et al moves horizontally rather than vertically, the substitute device would not function properly.

In order to distinguish more clearly from the cited prior art, claim 16 has been amended to require the drive means for advancing the flying saw through the cast billet to be "active", e.g. actuator 42 as described on page 8 and line 29.

Claim 20

The Examiner rejected claim 20 as unpatentable over Follrath et al. in view of Klotzbücher et al.

Essential elements of this claim are parts (d) and (e), which read as follows:

> (d) upon completion of the cut, accelerating the downstream conveyor relative to the upstream conveyor,
>
> (e) accelerating the frame and saw relative to the upstream conveyor but less than the acceleration of the downstream conveyor,

Neither Follrath et al. nor Klotzbücher et al disclose any steps equivalent to steps (d) and (e). For example, Follrath describes the action of the saw as follows (Column 8 line 27 to Column 9, line 31):

> As the ingot 24 leaves the casting unit drive assembly 16, it is guided onto the saw assembly 12. The saw assembly 12 is mounted on a frame 139 which has a pair of guide rollers 140 at its forwardmost end. The saw assembly includes a carriage 141 slidably mounted upon ways 142 for longitudinal movement on the frame 139 parallel to the ingot 24. To move the carriage 141 in such a longitudinal direction, an appropriate hydraulic cylinder 144 is located intermediate the ways 142. A saw 145 with a conventional rotary cutting blade 146 is mounted upon the carriage 141 on ways 148 for lateral movement relative to the ingot through actuation of a hydraulic cylinder 149. A protective guard 147 may be provided about the saw blade 146. Secured forwardly of the carriage 141 for movement with the carriage is a clamping mechanism 150 having a pair of clamping arms 151 immediately downstream of the saw assembly guide rollers 140. The clamping arms 151 are movable by means of a hydraulic cylinder 152 between an open position which permits passage of an ingot 24 relative into the saw assembly and a closed position engaging the ingot.
>
> The ingot is moved into the saw assembly under power of the drive rollers 89 until a predetermined length is sensed by a limit switch 154 located at the downstream end of the saw assembly 12 which activates the hydraulic cylinder 152 for the clamp 150

causing the clamping arms 151 to engage the ingot 24. The engagement of the clamp about the ingot, the saw carriage 141 will be moved along its ways 142 with the moving ingot. At the same time, the saw 145 is energized and the hydraulic cylinder 149 actuated to move the saw in a lateral cutting direction to cut through the ingot as the saw and log progress in a downstream direction.

At the end of the sawing cycle, the saw 145 has moved to the position shown in phantom in FIG. 13 and has progressed a longitudinal distance along the carriage ways 142 so that the cut-off ingot length is centered over and rests upon a saw table 155. The saw table 155 has an upwardly inclined flange 156 on one side thereof that is positioned in close relation to the moving ingot when the table is in a horizontally disposed position to prevent the cut ingot length from rolling off that side of the table.

In order to automatically transfer the cut-off length of ingot 24 from the table 155 to the adjacent storage pallet 25, the table 155 is pivotably mounted on a transverse rod 158 supported by a vertical extension 159 of the furnace 139. To tilt the table 155, a hydraulic cylinder 160 located below the outer end of the table has a piston rod 161 which is rotatably secured to the table for movement between an extended horizontal table position and a retracted tilted table position, shown in phantom in FIG. 13. To facilitate such movement of the table, the lower end of the hydrauilc cylinder 160 is pivotably mounted to a horizontal extension 162 of the support frame 139. Thus, by actuation of the hydraulic cylinder 160, the table 155 may be tilted downwardly causing the ingot length supported thereon to roll or be dumped onto the storage pallet 25 (FIG. 2).

Upon completion of the sawing and dumping operations, the saw 145 is returned to its laterally retracted position by actuation of the hydraulic cylinder 149, the hydraulic clamp 150 releases the ingot and the carriage 141 is then returned to its upstream position by actuation of the hydraulic cylinder 144. It will be understood that the sequencing of the operation of the ingot clamps 151, the outward movement of the cutting saw 145, the saw return movement, and the carriage return movement may all be controlled through a suitable hydraulic power unit. (underlining added)

Furthermore, Klotzbücher et al. describes the action of the flying saw in Column 4 at lines 29 to 56. The action is described as:

> First the unit 32 is accelerated up to the casting speed in the direction of the arrow A. Next the billets are clamped by the beam 35, which is mounted on the unit 32, moves together with the unit 32. The saw is now made to move forward (arrow B in FIG. 4) so that the saw blade 30 cuts through the billet while the billet is moving forward at the casting speed. The saw blade is then moved in the reverse direction (arrow C in FIG. 4) so that it returns to the starting position again. The beam 35 is unclamped and the saw unit 32 moves back quickly to its initial position.

Thus, in both cases, on completion of the cut, the saw blade and saw unit merely move back to their original positions.

There is therefore no disclosure of steps (d) and (e), so the references are not believed to be relevant to the invention of claim 20.

In view of the above, favorable reconsideration of the application is requested.

Respectfully,

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I hereby certify that this paper is being deposited this date with the U.S. Postal Service as first class mail addressed to Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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